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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.				
10/561,679	12/21/2005	Hyo Young Kim	2017-053	1384				
52706 IPLA P.A. 3580 WILSHIRE BLVD. 17TH FLOOR LOS ANGELES, CA 90010	7590 10/31/2007		<table border="1"><tr><td colspan="2">EXAMINER</td></tr><tr><td colspan="2">WIESE, NOAH S</td></tr></table>		EXAMINER		WIESE, NOAH S	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/561,679

Applicant(s)

KIM, HYO YOUNG

Examiner

Noah S. Wiese

Art Unit

4116

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) 12-17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/21/2005.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Status of Application***

1. The claims 1-17 are pending and presented for the examination.

### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. PCT/KR04/01640.

### ***Information Disclosure Statement (IDS)***

3. The information disclosure statement (IDS) was submitted on 12/21/2005. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner. Please refer to applicant's copy of the 1449 herewith.

### ***Claim Objections***

4. Claims 12-17 are objected to because they include reference characters which are not enclosed within parentheses.

Reference characters corresponding to elements recited in the detailed description of the drawings and used in conjunction with the recitation of the same element or group of elements in the claims should be enclosed within parentheses so as to avoid confusion with other numbers or characters which may appear in the claims. See MPEP § 608.01(m).

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 6-7 and 16-17 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims list materials that can be used to braze and coat the abrasive particles, but end the lists with "and so on". This language is very indefinite, and does not specifically teach what materials are to be used in these process steps.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

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9. Claims 1-3, 5, 8-9, 11-12 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunagawa (US 6071182).

**Claims 1-2, 8, and 11** are drawn to two methods of manufacturing a resin bonded diamond tool. **Claims 12 and 15** are drawn to a resin bonded diamond tool.

Sunagawa teaches a grindstone and a method for producing said grindstone.

The method comprises the steps of providing a die and placing in the die granular chips that are composed of diamond particles sintered together with metal particles (see claim 1). In one embodiment of the invention, a backing, which in this case is equivalent to the mold body of instant application, is provided that is porous and is impregnated with resin. The backing is placed over the grains in the die, which is equivalent to the step in instant application of placing the tool body in the die. Using heat and pressure, the resin is made to leave the backing and flow into the die between the granular chips and the backing (see column 4, lines 33-48). This is equivalent to the step in instant application of injecting resin into the space between the tool body and the die. Because the resin comes through the porous backing, the step of causing the resin to flow from the backing into the die is equivalent to injecting the resin through a resin inlet. Essentially, the grindstone and method taught by Sunagawa are a different embodiment of the same method claimed in instant application. The grinding tool produced is equivalent and comprises all of the same features, but in a different (flattened) form.

Claim 8 teaches an essentially equivalent method to claim 1 using powder resin instead of the presumably liquid, injectable resin used in claim 1. The powder resin is

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placed between the die and tool body with the diamond pellets, and sintered to bind the diamond pellets with the resin.

Sunagawa teaches an embodiment wherein the resin is powder and placed into the die directly with the diamond chips (see Figure 12 and column 5, lines 15-20). Heat and pressure are applied, and this step is equivalent to sintering the pellet and resin mixture (see Figure 5, lines 28-30).

It would have been obvious to one of ordinary skill in the art to modify the method taught by Sunagawa to produce a cylindrical grinding tool, rather than a flat grindstone. It is known in the art that grinding apparatuses can take on many shapes depending on the nature of the grinding task. One of ordinary skill in the art would have been motivated to use the form and method taught by Sunagawa in a different embodiment to produce a grinding tool with a cylindrical shape because cylindrical grinding tools are more adept at grinding and polishing smaller areas that grindstones are unable to reach. One would have expected reasonable success in such a modification because the grinding media and resin impregnation used by Sunagawa was shown to be effective, and therefore would presumably be effective for grinding in a different tool embodiment. When using the method taught by Sunagawa to manufacture a cylindrical grinding tool, one of ordinary skill in the art would have known that injecting the resin into the space between the mold and die would be an effective way of introducing it between the granular chips. One would have also known that using channels in the mold would be the equivalent to using a porous backing when using a tool body rather

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than a flat backing. The claim limitations of claims 1-2, 8, 11-12, and 15 are therefore obvious and not patentably distinct over the prior art of record.

**Claim 5** further limits claim 1 by stating that the tool body is made of the same material as the resin. **Claim 14** further limits claim 12 with the same limitation.

Sunagawa teaches that the backing, which is equivalent to the tool body of the instant application, is resinoid (see column 3, lines 45-47). This is taken to be equivalent to being made of the same material as the resin.

**Claims 3 and 9** further limits claims 1 and 8 by stating that the diamond pellets are between 3 and 5 mm.

The size of the diamond pellets (granulated chips in the Sunagawa patent) used with the tool is a function of the type of grinding done with the tool. It is known in the art that large grit sizes, such as those of claims 3 and 9, are to be used when rough grinding is desired. One of ordinary skill in the art, through ordinary optimization of the teachings of Sunagawa, would have tried grit sizes that meet the limitations of claims 3 and 5 if the desire was to create a tool for rough grinding. As such, the choice of pellets between 3 and 5 mm is an obvious modification of Sunagawa, and claims 3 and 9 do not add patentably distinct limitations.

10. Claims 4, 10 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunagawa (US 6071182) in view of Fisher (US 5332098).

**Claims 4 and 10** further limit claims 1 and 8 by stating that binding recesses are formed and filled with resin. **Claim 13** further limits claim 12 by stating that the tool has a binding projection.

These limitations are drawn to the structure and shape of the diamond tool. As discussed above, it is the position of the examiner that it would have been obvious to one of ordinary skill in the art at the time the invention was filed to use the method and structure taught by Sunagawa to create grinding tools with a different form. The binding recesses and binding projection are features of a tool with a different form. Through the modification of Sunagawa in view of Fisher, one of ordinary skill would arrive at a grinding tool with the structure of Sunagawa, but in a form comprising a binding projection.

Fisher teaches a number of different grinding tips as part of a kit. Two of the tips include a portion of grinding media that angles in from the outer cylindrical surface. The binding projection of the instant application is essentially a portion of the resin/pellet layer that extends over the end of the cylindrical portion of the grinding tool and onto the perpendicular plane (the top). This limitation is fulfilled by Figures 5 and 15, wherein the portion of the tip that extends inwards beyond the cylindrical portion of the grinding tip would act to increase the binding force between the grinding media and the underlying tool body. Therefore, this feature is equivalent to the binding projection (16a). It is also the position of the examiner that one of ordinary skill in the art, through normal optimization when modifying the tool taught by Sunagawa, would arrive at a configuration containing a feature with the equivalent function as the binding



recess/projection. Therefore, the additional limitation of claims 4, 10, and 13 is not patentably distinct over the prior art of record.

11. Claims 6-7 and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sunagawa (US 6071182) in view of Sherman et al (US 2002/0069592).

**Claims 6 and 16** further limit claims 1 and 12 to add the step of brazing the diamond particles together before adding resin. **Claims 7 and 17** further add the limitation of coating the abrasive pellets before brazing to prevent the brazing material from absorbing into the pellets.

Sunagawa does not does teach coating or brazing the pellets. However, it was known in the art at the time the invention was filed that coated abrasive particles with a metal coating can lead to improved bonding with a matrix material, and also have the effect of isolating the abrasive particle from the metal of the matrix or bond material (see page 1, paragraphs 0004-0006). Thus, it would have been obvious to add a coating and brazing step to the process taught by Sunagawa et al in order to increase the strength of the bonds between the pellets, and thus increase the strength and reliability of the binding tool. Sherman et al teaches such a method of coating abrasive particles.

Sherman et al teaches abrasive particles that are encapsulated with a deposit of metal material. The abrasive particles can contain diamond (see Abstract). The main coating metal taught by Sherman et al is rhenium, ruthenium, or osmium. However, the coating taught by Sherman et al still anticipates the limitations of the claims because applicant states that the coating can be Ni, Ti, Cu, *and so on*, indicating that any metal with a melting point higher than brazing material is suitable. The materials taught by

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Sherman et al fit this limitation. This is also true of claims 6 and 16, which recite various materials that can be used for brazing, but also include "and so on". This indicates that any suitable brazing material can be use, and suitable brazing materials are well known in the art. Therefore, all of the limitations of claims 6 and 16 are met.

Sherman et al teaches that the deposit material protects the underlying abrasive material during forming processes, such as brazing and powder metallurgy techniques (see page 2, paragraph 0018). This is the same purpose claimed for coating the pellets in instant application. One of ordinary skill in the art at the time the invention was filed would have been motivated to add the coating and brazing taught by Sherman et al to the method taught by Sunagawa in order to enhance the bonding between the chips and protect the chips while doing so. One would have expected reasonable success in this modification because Sherman et al teaches that coated particles retain their abrasive ability (see page 2, paragraph 0018). Additionally, brazing is a very well known technique that one could reasonably expect to be carried out without detrimental effects. Therefore, claims 6-7 and 16-17 are obvious and not patentably distinct over the prior art of record.

### ***Conclusion***

12. No claim is allowed.
13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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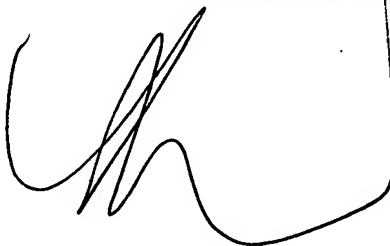
14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Noah S. Wiese whose telephone number is 571-270-3596. The examiner can normally be reached on Monday-Friday, 7:30am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on 571-272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Noah Wiese  
October 25<sup>th</sup>, 2007  
AU 4116

VICKIE Y. KIM  
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to be 'VYK', written over a horizontal line.